

WHAT IS CLAIMED IS:

1. A chip pick-up apparatus, comprising:

a pick-up head for picking up a chip held on a sheet;

a holding table for holding the sheet;

5 a recognition means for recognizing the chip by capturing  
an image of the chip held on said sheet;

a positioning means for positioning the chip to be picked  
up relatively to said pick-up head on the basis of the  
recognition result by said recognition means; and

10 a sheet separating mechanism for separating the sheet  
from the chip by sucking the sheet from a suction plane brought  
in contact with a lower surface of the sheet, said sheet  
separating mechanism being arranged below said holding table,

wherein said sheet separating mechanism includes:

15 a plurality of sucking grooves formed in said suction  
plane;

a plurality of boundary zones, each of which separates  
the sucking grooves adjacent to each other and supports the  
sheet in their contact with the lower surface of the sheet during  
20 sucking;

suction members movably provided in the sucking grooves,  
respectively so that when they are moved toward the lower  
surface of the sheet, they are brought into contact with the  
lower surface of the sheet to suck the sheet;

25 a moving means for moving said suction members; and

a sucking means for sucking the sheet from said sucking grooves.

2. A chip pick-up apparatus according to claim 1,  
5 wherein said chip is supported through the sheet by said boundary zones in a state where said suction members have left the surface of said sheet.

3. A chip pick-up method for picking up a chip held  
10 on a sheet using a pick-up head, comprising:

a recognition step of recognizing the chip by capturing an image of the chip held on the sheet;

a positioning step of positioning the chip to be picked up relatively to the pick-up head on the basis of the recognition  
15 result in the recognition step;

a sheet separating step of separating the sheet from the chip by sucking the sheet from sucking grooves with boundary zones being kept in contact with a lower surface of the sheet; and

20 a holding step of holding an upper surface of the chip separated from the sheet using the pick-up head, wherein prior to said recognition step, suction members are moved to be brought into contact with the lower surface of the sheet and the sheet is sucked so that the deformation of the chip held  
25 on the sheet is reformed.

4. A chip pick-up method according to claim 3, wherein said sheet separating step is implemented in a state where said suction members have left the lower surface of said sheet, and

5 in said sheet separating step, said chip is supported through the sheet by said boundary zones each of which separates the sucking grooves adjacent to each other.

5. A chip pick-up apparatus comprising:

10 a pick-up head for picking up a chip held on a sheet;

a holding table for holding the sheet;

a recognition means for recognizing the chip by capturing an image of the chip held on said sheet;

15 a positioning means for positioning the chip to be picked up relatively to said pick-up head on the basis of the recognition result by said recognition means; and

20 a sheet separating mechanism for separating the sheet from the chip by sucking the sheet from a suction plane brought in contact with the lower surface of the sheet, said sheet separating mechanism being arranged below said holding table,

wherein said sheet separating mechanism includes:

a reforming means for reforming deformation of said chip in contact with the lower surface of said sheet; and

25 a separating means for separating the sheet from the chip by deforming said chip.

6. A chip pick-up method for picking up a chip held on a sheet using a pick-up head, comprising:

5 a recognition step of recognizing the chip by capturing an image of the chip held on the sheet;

a positioning step of positioning the chip to be picked up relatively to the pick-up head on the basis of the recognition result in the recognition step;

10 a sheet separating step of separating the sheet from the chip by sucking the sheet from sucking grooves, with boundary zones being kept in contact with a lower surface of the sheet; and

15 a holding step of holding an upper surface of the chip separated from the sheet using the pick-up head, wherein prior to said recognition step, deformation of said chip held on the sheet is reformed, and in the sheet separating step, said chip is deformed to peel the sheet from the chip.